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THE CORRELATION BETWEEN ASTHMATIC SYMPTONS IN CHILDREN AND AIR POLLUTION LEVELS IN KYOTO CITY (3-8)

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and

Section for the Investigation of

School Children's Health and Air Pollution

3-8 THE CORRELATION BETWEEN ASTHMATIC SYMPTOMS IN CHILDREN AND AIR POLLUTION LEVELS IN KYOTO CITY

[3-8 Kyoto Shi ni Okeru Taiki Osendo to Shoni Zenshokuyo Shojo to no Kankei]

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3-8 THE CORRELATION BETWEEN ASTHMATIC SYMPTOMS IN CHILDREN AND AIR POLLUTION LEVELS IN KYOTO CITY

1. Objectives: The objective is to elucidate the effects of air pollution on health epidemiologically as it pertains to children.

2. Subjects and Methods:

A. The School Children's Health Survey: The subjects were all of the first and second grade students in all of the 153 primary schools in Kyoto City (a total of 36,789 pupils). A respiratory symptoms survey sheet was distributed to all of the mothers through the children to obtain written responses (November 1970, recovery rate 97%).

B. School Environmental Survey: Atmospheric SO_2 and NO_2 pollution levels were measured at the 153 schools that had been the subject of the school children's health survey. (Alkali filter paper method, for one month each during November 1970 and February 1971).

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3. Results:

1. The Correlation between Complaints by Question and Low and High Level SO_2 Pollution

1 質問項目	2 低汚染地区	3 高汚染地区
4 — A 1. たえず口で呼吸している。	15.1%	21.0%
2. よく咳をする。	12.2	18.0
3. よく痰を出す。	9.7	8.1
4. よくのどがはれたり痛んだりする。	17.5	21.0
5. かぜを引きやすい。	42.8	46.7
6. かぜを引くといつもゼイゼイする。	25.4	30.6
7. かぜを引くといつもなかなか治りにくい。	17.5	22.6
B 8. かぜを引いたときいつもゼーゼー(ヒューヒュー)いう。	11.6	16.2
9. かぜを引いたときいつもゼーゼー(ヒューヒュー)いうことがある。	2.9	2.1
10. [illegible]	2.2	6.2
11. 今までにぜんそくと診断されたことがある。	13.7	15.2
12. 胸がしめつけられるようになることがある。	3.0	9.0
13. 夜ねているとき胸がゼイゼイとなることがある。	12.1	16.7
14. 今までにぜんそくであろうと医者にかかったことがある。	12.9	14.3
15. 現在医者にぜんそくであると言われている。	3.9	3.9
16. この一年間にのどがゼーゼー(ヒューヒュー)いうとともにぜんそくが出たことがある。	9.2	11.1

Key:

1 - question; 2 - low pollution level; 3 - high pollution level; 4 - A 1. breathes through the mouth because the nose is always stopped up, 2. often coughs, 3. discharges a lot of phlegm, 4. throat often becomes swollen and [illegible], 5. susceptible to colds, 6. coughs violently whenever a cold is contracted, 7. colds last a long time with difficult recovery; B 8. always wheezes with a cold, 9. sometimes wheezes even without a cold, 10. wheezes virtually every day, 11. has had asthma up to the present time, 12. [illegible] feels suffocated, 13. when sleeping at night [illegible], 14. the doctor says that the subject has had asthma up to the present, 15. the doctor says that the subject has asthma now, 16. during the past year, has wheezed and has had asthma.

2. Rates of Asthmatic Symptoms by Level and SO_2 and NO_2 Pollution Levels

SO_2 (ppm)	A°	B°
0.00 ~ 0.09	4.46%	4.27%
0.10 ~ 0.19	4.25	4.52
0.20 ~ 0.29	1.08	4.67
0.30 ~ 0.39	0.87	5.02
0.40 +	1.51	6.06
T	-.15	.32** 1

NO_2 (ppm)	A°	B°
0.000 ~ 0.019	1.26%	3.77%
0.020 ~ 0.039	1.42	4.46
0.040 ~ 0.059	1.20	5.03
0.060 +	1.40	5.36
T	-.04	.26** 1

2 A°: 最近1年間に，起坐呼吸を伴う喘息様発作があった場合（定型喘息型症状）.

B°: 最近1年間に，呼吸困難を伴う喘息様発作があったが，起坐呼吸はみられなかった場合（定型喘息軽症型）

C°: 最近1年間に，喘息様症状があったが，呼吸困難を伴わなかった場合（非定型喘息）.

D°: 現在に喘息様症状がないが，最近1年間は現のれず治癒と見なしうる場合（既往喘息）.

E°: 喘息様症状は既往・最近ともないが，一般的に呼吸器症状（ロいし通数）疾患が現在ある場合.

Key:

1 - [Tr. Note: Not an ideograph, apparently **]
2 - A°: Cases of asthmatic seizures accompanied by orthopnea during the most recent one year (typical serious asthma symptoms). B°: Asthmatic seizures associated with difficutly in breathing during the most recent year, but no orthopnea observed. (Typical light asthma symptoms) C°: Asthmatic symptoms during the most recent one year, however not accompanied by difficulty in breathing (Atypical asthma) D°: A history of asthmatic symptoms, but which have not appeared during the most recent one year. Regarded as cured (History of asthma). E°: No past or recent history of asthmatic symptoms, but general symptoms of the respiratory organs (or [illegible]) at the present time.

3. Comparison with the Kitakyushu City survey.
Incidence of Typical Asthma

1 地区	2 有症率	3 対象数	4 SO_3 (1965) mg/100cm²
5 北九州市戸畑	13.5%	2194	1.3
6 霧ヶ丘	8.5	354	0.9
7 京都市平均	6.4	35,310	0.6
8 下京区	7.3	777	0.9
9 北区	5.2	2,109	0.3

Key:

1 - district; 2 - percent with symptoms; 3 - number of subjects; 4 - SO_3 (1967); 5 - Kitakyushu City, Shiroyama; 6 - Kirigaoka; 7 - Kyoto City average; 8 - Shimokyo-ku; 9 - Kita-ku.

4. Summary:

(1) The incidence of typical asthma symptoms among the lower grade students in Kyoto City was 6%. This is approximately 0.4 times the incidence among school children in the highly polluted districts of Kitakyushu City. It was approximately 0.8 times that of the relatively unpolluted districts in that city (Table 3).

(2) The incidence of typical asthma symptoms in the relatively highly polluted district of the city ([illegible]-ku) was approximately 1.4 times that in the districts where the levels of pollution are low (Table 3).

(3) The incidence of typical asthma symptoms among the school children ranged widely between 0.00 and 8.74% by school. A significant positive correlation was observed between this and the levels of pollution at each school (Table 2).

(4) The incidence of atypical asthma symptoms (data omitted) as well as the complaints of ordinary symptoms of the respiratory organs (Table 1) also showed a parallel correlation with the levels of atmospheric pollution

at the schools.

(5) The incidence of serious, typical asthma did not demonstrate a significant correlation with the levels of air pollution (Table 2).

(Reference data)

[Illegible]da, Iwanishi, et al.: Fukuoka-ken ni Okeru Taiki Osen. [Air Pollution in Fukuoka Prefecture], No. 7, 1968.